ABSTRACT OF THE DISCLOSURE

An olefin isomerization process employs a basic metal oxide catalyst, such as magnesium oxide, which retains at least about 85 percent of its initial activity for at least about 168 hours of on-stream time. The catalyst is preferably a high purity magnesium oxide. The olefin isomerization process and catalyst described herein are advantageously used for the production of a terminal olefin such as 1-butene from an internal olefin such as 2-butene.